

AI

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How AI is paving a new way for drug discovery in the UK

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Despite significant advancements in technology, developing drugs remains difficult and costly. It now often takes up to a decade and costs around \$2.7bn to develop a new drug average. What impact could AI have on the UK's drug discovery sector and what is investor appetite like?

A [report](#) published by Dealroom last month found the vast majority of investment going to the first phases of the discovery pipeline can be justified only with the belief that new AI and computational discovery platforms can improve clinical success rates.

Hugo Villanueva, biotech investor at Octopus Ventures, says the omnipresent role of AI in both the drug discovery and development market is already apparent around the world, with the US leading the charge and the UK following close by.

"Within drug development, the most successful use cases of AI are currently within the early stage of pre-clinical development," Villanueva tells *UKTN*.

"Its current uses are mainly within expanding the funnel of drugs at hit-to-lead, leading optimisation stages of drug discovery where small molecules and antibodies are mostly generated via high-throughput screens.

"This enables the company to run more experiments [on a computer] both faster and cheaper than traditional biotech companies."

Villanueva says there are also instances where AI is used to find novel targets using knowledge graphs and natural language processing to mine literature and genomic data for drug targets.

"The field itself has received considerable interest nationally with the UK BioIndustry Association, the largest life and biotech trade association in the UK, creating a special focus group termed 'techbio' specifically tasked at enabling AI-enabled biotechs to get to market," he adds.

Some of the top publicly-listed companies in the field have come out of the UK – notably Exscientia and Benevolent AI, which listed in 2021 and 2022 at valuations of more than £2bn and £1.5bn, respectively.

In February, Curve Therapeutics [raised a £40.5m Series A round](#) to develop its cancer drug discovery platform. Its CEO and cofounder, Simon Kerry, says new ways of addressing disease targets that had previously been considered 'undruggable' are now the subject of successful drugs thanks to new technologies, platforms and modalities.

"AI is potentially a powerful tool to assist the drug design process, supplementing the disease and biology insights that are the cornerstone of all good discovery companies," Kerry tells *UKTN*.

"AI will become more prevalent in the sector as companies look for new tools to solve drug design problems."

UK investment 'sluggish'

On a global playing field, the UK's drug discovery market is the largest for biotech investments in Europe. Kerry says this reflects the UK's unique combination of excellent academic institutes, a mature pharma sector, first-class service providers, an entrepreneurial culture and a mature investor base.

"The UK has some excellent drug discovery companies. However, after two boom years for biotech investment (£2.7bn in 2020 and £4.5bn in 2021), UK investments have been sluggish since 2022 – £1.8bn in 2022 and £1.25bn in 2023," notes Kerry.

"This is driven by a combination of a worldwide recession and high interest rates that are being experienced globally."

While it may be a long time before we see a repeat of the biotech investment boom of 2020 and 2021, more recent figures represent a return to more normal levels in the UK.

"The biggest challenge affecting UK drug discovery is access to finance: venture firms are still reluctant to invest in new companies and the UK public markets are, in general, not best suited to drug discovery companies," says Kerry.

"The UK government recognises this issue and is already trying to introduce measures that would open up £50bn currently locked up in defined contribution pensions to invest in drug discovery businesses."

Villanueva says the investor base for AI-enabled drug discovery companies tends to fall into two categories – generalist and life science investors.

The generalist investors, he says, usually come from a tech background and invest with the mindset that a platform company enables multiple shots on goal, hence hedging the clinical risks. The life science investors, on the other hand, tend to value companies on their assets, resulting in harsh valuations for platform companies – thus penalising founders.

"The reality lies somewhat in the middle given clinical risks still indubitably exist with platforms, yet high-conviction investors valuing the companies on their platform rather than assets are needed to pump-prime the company at the early stage," adds Villanueva.

"While the US has over 100 tech-bio VC investors, there are less than ten in the UK."

'The equivalent of Facebook misplacing Myspace'

Looking ahead, Villanueva believes the UK will likely move to a world where most biotechs and academics use AI to an extent.

"We are now entering the second generation of companies where I believe we will see the equivalent of Facebook displacing Myspace in AI-drug discovery," he says.

"There are currently three million people in the UK living with cancer and if AI is able to move the needle of drug development by even 5%, this would have dramatic downstream positive effects on patients' lives."